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IOWA CONSERVATION COMMISSION

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An EQUAL OPPORTUNITY Agency

2404 South Duff Avenue
Ames, Iowa 50010

September 20, 1984

Dear Colleague:

Enclosed is a copy of our 1984 Forest Pest Report written by the summer intern we hired this year. The report covers observations made by the summer intern in her travels over the state as well as her observations with our field foresters on their permanent pest plots taken in June.

It also includes the results of our aerial sketch mapping survey done in August. Another feature of the report is the diagnosis that came through the Plant Disease Clinic and Extension Entomology office at Iowa State University. Most of these reports referred to ornamental and urban problems.

The only activity not included was the results of the August observations of the field foresters on their permanent survey pest plots. These observations are included in an attached supplement.

I hope this report will be of interest to you.

Sincerely yours,

Roy G. Hatcher

Roy G. Hatcher
Protection Forester

RGH/gh
enclosure

IOWA FOREST PESTS -- 1984

Iowa Conservation Commission
Forestry Section

Linda M. Haugen
Forestry Intern
Forest Insect and Disease Management

TABLE OF CONTENTS

INTRODUCTION..... 1

PEST PLOTS..... 1

AERIAL SURVEY..... 1
Methods..... 1
Results..... 2
Suggestions..... 2

ENTOMOLOGY EXTENSION & PLANT DISEASE CLINIC REPORTS..... 2

OAK WILT..... 3

HARDWOOD DIEBACK AND DECLINE..... 4
Ash decline..... 4
Maple decline..... 4
River birch decline..... 4
Walnut dieback..... 5

MAJOR CONIFER PROBLEMS..... 5

GYPSY MOTH..... 6

NURSERY PROBLEMS..... 7

CONCLUSIONS..... 9

APPENDIX..... 11

INTRODUCTION

The purpose of a forest insect and disease summer intern is to provide the student with a learning experience and to collect information on the status of forest pests in Iowa. The following is a report of information collected by myself and other persons and my interpretation as the 1984 summer intern.

I spent the summer collecting information on forest pests through various surveys and personal observations. I feel that Iowa timberlands seem to be fairly pest free on most sites. Cattle appeared to be causing more damage than insects. The pest problems having the greatest impact on native Iowa forests are oak wilt, Dutch elm disease, ash decline, and possibly two-lined chestnut borer. Pests are not the greatest forest problem in Iowa, but they have the potential to cause significant loss.

PEST PLOTS

Each district forester has approximately 20 permanent pest plots established representing windbreaks, woodlands, and conifer and hardwood plantations. A survey of these plots for pest problems is conducted once in June and once in August. These reports indicate which pests are occurring statewide, and over time indicate whether these pests are reoccurring on sites year after year. If the data is all recorded in the same manner, an estimate of the percent damage by forest pests can be attained.

The results of the June survey have already been released and distributed. The August survey is not yet completed.

In June the main hardwood plantation problems that showed up in the survey were anthracnose, deer damage, and poor management. In conifer plantations, winter burn, deer damage, European pine sawfly, and poor management were the main causes of trouble. In woodlands oak wilt was the main problem. Windbreaks were damaged most by Dothistroma needle blight and other needle diseases and by honeysuckle aphid. The only surprising discovery was oak wilt in a nine year old red oak plantation in the Amana Colonies. It had not before been reported on a plantation that young. Very few hardwood defoliators were active during the June survey.

AERIAL SURVEY

Methods

In August 1984, sketchmapping was used by the Forestry Section of the Iowa Conservation Commission to conduct an aerial survey of forest lands in Iowa. This is the fifth year this type of sampling has been used. The areas surveyed included Shimek State Forest, Stephens State Forest, Yellow

River State Forest, Waubonsie State Park, and a strip of private and state owned forest in Western Iowa. Maps of these areas and the points of damage recorded are included in the appendix.

Approximately 100,000 acres were covered in the survey, based upon area of the state forests involved and length of flight lines. A Cessna 172 was used. The survey took a total of 13.6 hours flight time, including ferrying to starting points. The total cost for plane and pilot service was $737.05. A tentative flight schedule and the actual flight times are included in the appendix. Personnel involved with the survey are on this schedule also.

Results

About 100 points were identified from the air. Most of these were suspected to be oak wilt, Dutch elm disease (DED), or pine problems of some sort. Approximately thirty of the points were located in the ground checks. Most of the points that were identified as either "oak wilt or DED" from the air turned out to be oak wilt. DED has already taken out most of the large elms, so the elm trees exhibiting DED were usually small trees in the understory which were not visible from the air. Oak wilt was widespread and common over the entire state. One "oak wilt" spot turned out to be a massive cottonwood which had died of unknown causes. An area where DED was recorded from the air was actually hackberry which was severely affected by hackberry lace bug and appeared golden brown. No major insect defoliation was detected. Some of the pine problems identified were white pine blister rust, Diplodia shoot blight, and Fomes Annosus (renamed Heterobasidion annosum). Samples are still being tested for pine wood nematode. The points sighted are marked on the maps of the areas surveyed.

ENTOMOLOGY EXTENSION & PLANT DISEASE CLINIC REPORTS

One indicator of pest problems in Iowa is reports to the Plant Disease Clinic and Entomology Extension at Iowa State University. Most of the tree problems submitted to the clinic by County Extension Directors and private individuals involve either ornamental or windbreak trees.

This pest season began with numerous reports of winter damage. Winter burn on conifers and winter injury to hardwoods were the main problems reported through May. Soon after this anthracnose reports began to pour in. Hardwood anthracnose was very heavy again this year. The trees affected included sycamore, oak, maple, ash, horse chestnut, and walnut.

The most commonly reported problems with conifers were Rhizosphaera needlecast of spruce and mites. Dothistroma needle blight was common on Austrian pine and Swiss needlecast on Douglas fir. Other considerable problems were European pine sawfly, Diplodia shoot blight, Cytospora canker to spruce, and northern pine weevil on white pine.

Hardwoods were plagued by a host of minor problems and a few major ones. Dutch elm disease and oak wilt were both submitted to the clinic for identification. Maple decline caused by a combination of factors was also a major concern (see Insect, Weed and Plant Disease Newsletter, pages 121-124, July 20 issue). Oak and maple were the trees most often affected by iron deficiency. Conditions seemed to be just right again this year to bring out all four of these problems. In 1983 about the same number of incidents of these occurred, but this year the damage seemed more severe on those trees affected.

The most unusual problem reported to the clinic was oak leaf deformation (described in the June 1 issue of the Insect, Weed and Plant Disease Newsletter). This occurred primarily on white and bur oak in the northeastern 1/4 of the state. A definite cause has never been confirmed. There does not seem to be any permanent damage from the situation. It will be interesting to see if this problem reoccurs next year.

Hardwood scorch symptoms, particularly on ash, began to appear in mid to late summer. A few of the other hardwood problems reported include applescab, cedar-apple rust, aspen shoot blight, and honeysuckle leaf blight, leafspot, aphid, and powdery mildew. Various fungal leaf spots, aphids, and scale insects, and a host of minor galls were also reported. A few reports of herbicide damage came in throughout the season.

OAK WILT

Oak wilt, cause by the fungus Ceratocystis fagacearum, was common over Iowa in 1984. The aerial survey, pest plots, and Plant Disease Clinic reports all reflected the problem. More oak wilt trees were suspected in the aerial survey than had been marked on the survey maps in the past two years. The Plant Disease Clinic did report more positive oak wilt cultures than in either of the past two years. Some foresters I talked to felt they were seeing more oak wilt activity this year than before, while others felt it was about the same. From this is appears that there was just as much or more oak wilt in Iowa's timber than there has been in past years.

Many of the affected oak sighted in the aerial survey were individual black oaks peppered throughout a mixed hardwood stand. Black oak is the most susceptible tree in these stands, so these trees will probably die out without forming the center of a pocket unless other black oak are present nearby.

My opinion of oak wilt in Iowa is that it will continue to take out individuals and pockets of trees throughout our woodlands, but will not ever reach nearly the level of damage to oak as Dutch Elm Disease on elm. Oak wilt seems to be a native pest, and may have been present in Iowa almost as long as oak. Attempted control of oak wilt is justifiable only when it is economical, due to the high value of the forest resource.

HARDWOOD DIEBACK AND DECLINE

Ash decline

Over the past few years a problem has shown up in Iowa's white and green ash. Specific areas that have exhibited death of ash after a two to three year decline are Waubonsie State Park in Southwest Iowa and the Dubuque area in Eastern Iowa. Trees of all sizes on all sites can be affected.

An ash dieback is known to occur in the Eastern United States. The cause for this is unknown also, but is suspected to be a virus or mycoplasma. There are cankers related to this ash dieback, but they may be caused by secondary agents.

In an attempt to find some clue to the problem with ash in Iowa, I assisted Allan Pratt in cutting down a tree in Waubonsie State Park and searching it for signs of a casual agent. We discovered Cerambicidae larvae (round-headed borers) in a main lateral root. The root was also affected by Armillariella mellea root rot. Neither of these usually affect healthy vigorous trees, but could kill the tree if it were already under stress. We are still left searching for a primary cause of stress which would weaken the tree and allow root rot or root borers to attack. A possible cause of weakness is the ash borer Podosesia syringae fraxini. It was not present on the ash checked in Waubonsie State Park. No cankers were found either.

Maple decline

Many hard maples across Iowa have demonstrated maple decline again this year. In most cases a specific cause is not identified. The July 20th issue of Iowa State University Cooperative Extension`s Insect, Weed and Plant Disease Newsletter contained an article by Laura Sweets concerning this problem. (See appendix) Most of the trees affected are urban trees, which are growing in a typically stressed environment. If this begins to affect a large number of maples in forest situations, more study should be given to the problem.

River birch decline

River birch in the bottomlands of Shimek State Forest and surrounding areas has continued to decline, die back from the top, and eventually undergo complete mortality. A similar problem has been reported in North Central Iowa. The cause is still unknown.

In 1982 the summer intern sampled and cultured birch from Shimek State Forest. He could not isolate a casual agent.

Increment cores taken this summer indicate that there could be a bacterial infection in the heartwood of these river birch. This should not cause dieback unless the bacterial infection extends out into living tissue. A

sample of the heartwood and cambial tissue will be cultured to learn if a bacterial agent is present. We are still hoping to discover the cause of this decline.

Walnut dieback

Pathologists have tried to determine the cause of walnut dieback since it was first discovered at Yellow River State Forest in July 1979. The disease blights and blackens the leaves, causes branch dieback, and forms cankers. It has been found only on bottomland sites and seems to be related to microclimate conditions.

This year Kathy Robbins of The State and Private Branch of the U.S. Forest Service and Ed Hayes of the Minnesota Department of Natural Resources came down to examine a site near Decorah which exhibited the dieback. Minnesota has been experiencing similar problems with its walnut. The plantation near Decorah did have walnut dieback and cankering. The walnut areas previously affected in Yellow River State Forest demonstrated dieback again this year, but not as severely as last year. Samples of dieback from the progency study at Yellow River were given to Kathy Robbins for analysis. Weather data was also recorded by Mike Ostry (North Central Forest Experiment Station) in the progeny study area.

From the continuing study of walnut dieback, it appears that at least four main fungi are involved in the problem: Chrystosphaerella and Mycosphaerella which primarily cause leaf damage and Phomopsis and Phyllosticta. Only Phomopsis and Phyllosticta were isolated from the samples taken at Yellow River this year and analyzed by Kathy Robbins. The cankers which develop on the main stem in this disease may originate at pruning wounds or other damaged tissue.

At this point it appears that walnut dieback is not a widespread problem. In most of the instances were it occurs, it only kills a few trees each year. Pathologists and foresters will continue to observe the situation to see if it increases in severity or impact.

MAJOR CONIFER PROBLEMS

Several conifer plantings in the state have shown various problems. This report is not intended to cover them all, just a few which have been diagnosed.

Diplodia shoot blight, Diplodia pinea -- This fungus causes shoot dieback and/or cankers on primarily Red, Jack, Scotch, and Austrian Pine. Literature states that it usually affects stressed trees. It is most easily diagnosed by the presence of small black fruiting bodies on cones and dead needles.

In Shimek State Forest, Diplodia shoot blight is causing Red pine death in several plantings. The infection initially causes flagging of branches, but eventually kills mature trees. It can also kill small trees in a single season.

White pine blister rust (WPBR), Cronartium ribicola -- WPBR is only known to occur in the northern half of Iowa. This was the main cause of pine death identified in the aerial survey of Yellow River State Forest. The losses due to WPBR are not significant in Iowa as there is such a limited market for pine here.

Annosus root rot, Heterbasidion annosum -- Annosus root rot is known to occur in only the southern half of Iowa. In the past it has been identified in Stephens State Forest and Shimek State Forest. Some of the current pine death in Stephens is being attributed to this cause.

Pine wood nematode (PWN), Bursaphelenchus lignicolus -- PWN is vectored to pine by round headed borers. These borers will usually attack only stressed trees. PWN also affects primarily stressed trees.

PWN was diagnosed in Shimek State Forest in 1980. It has caused the most extensive damage there in a red pine plantation which was stressed by being off-site and hail damage. Some pine death in Shimek continues to be attributed to the nematode. PWN has also been identified in Yellow River State Forest. It has the potential to be found anywhere in Iowa.

Other conifer problems which are affecting conifers in Iowa are: an unknown decline of spruce windbreaks in Northeast Iowa, white pine root decline, and various needlecasts. Naemacyclus needlecast has been diagnosed on Scotch pine in Iowa recently. This is something that needs to be checked on Christmas trees and windbreaks in the fall and spring.

GYPSY MOTH

Trapping in 1984 was planned to fulfill two objectives. The first of these was to delimit two areas where gypsy moths have been recovered in each of the past two years. The second was to survey the state for other gypsy moth occurrences.

A priority system was used to distribute the traps for the survey. First priority was urban areas of over 4000 population (85 cities in 65 counties). Second priority was high-use recreational areas, such as Rathbun Reservoir, Yellow River State Forest, and the Herbert Hoover Memorial. Both first and second priority areas received two traps/square mile. Third priority was rural areas in selected counties. These areas received one trap/square mile of forest. A total of around 3650 traps was planned for 1984.

Gypsy moth infestations were suspected near Mount Pleasant in Henry County and Morgan Creek Park in Linn County. In 1982, one male gypsy moth was trapped in each of these areas. In 1983, nine male moths were found in one

trap in a Mount Pleasant campground. Two gypsy moths were confirmed from the Morgan Creek area last year also. Approximately 150 traps were placed in each of these areas in 1984. These traps yielded no gypsy moths in Henry County as of August 21st. One moth was trapped near Morgan Creek Park this year. So far no infestation has been proven in either area.

Five other gypsy moth trappings have been confirmed in 1984. Three of these were in Polk county, in the Des Moines/West Des Moines area. One moth each was found near Calmar in Winneshiek county and near Mason City in Cerro Gordo county. No gypsy moth had been reported in either of those two counties previously.

Fewer gypsy moth trappings were confirmed in Iowa in 1984 than in either of the past two years. No infestations have been proven in the state, but areas of repeated trappings are being closely monitored. It appears that Iowa has escaped a gypsy moth problem for another year, yet the potential for an infestation is a major concern in Iowa's forests.

NURSERY PROBLEMS

A few pest problems appeared in the state nursery in Ames this season. These problems could become significant if they affect the quality or quantity of nursery stock available for planting.

One pest which has been a problem in the past is pine needle scale. In 1981 scale was a serious problem in the nursery. At that time two Iowa State students studied the problem as a project for the forest pest management course PPSW 416. They proposed a management system of spraying the windbreaks and moving the beds some distance from the infested windbreaks.

In 1984, two other students chose a followup study on the problem for this project in the same course. They intensively sampled the one and two year seedlings beds in May and found no pine needle scale. They found a moderate level of viable scale in the windbreaks. The conclusion was that the rigorous spraying schedule and management of the pine nursery beds has eliminated, or at least greatly reduced, scale in the seedling beds.

Another pest problem which is doing a "repeat performance" this year is Phytophthora root rot of black walnut. This fungus was identified in the nursery last year. The bed being most affected is quite low and had standing water this spring. Scattered walnut seedlings contract the disease and die, appearing wilted then blackened.

This fungal disease has caused significant loss of stock in some Indiana nurseries in the past. It can develop into a serious problem. The damage to walnut in the Ames nursery has only been observed in the wettest beds, so the problem should not effect the supply to seedlings in 1985. Phytophthora root rot is not expected to become a major problem in Ames, however it should be closely watched and material from the heavily infected

bed should be destroyed as those trees may have root damage that will affect their quality or carry the infection.

The chokecherry in the nursery has become infected with a leaf blight again this year. The fungus responsible was identified as Coccomyces hiemalis. A benolate fungicidal spray was used to control the blight. A few new leaves have come on since then, but they are becoming infected also. Last year the blight reduced the available stock, but there was still enough to meet demand. The blight will definitely affect the quantity, and possibly quality, of stock available in 1985, but there may still be enough stock to supply the demand.

The honeysuckle stock in the nursery has also been affected by a leaf blight, Herpobasidium deformans. The tatarian honeysuckle seemed most susceptible and became infected first. There does not appear to be an effective spray for the fungus. The tatarian honeysuckle were mown off to remove the diseased portion. A flush of new growth came back. This should not affect the size of stock available since this was two year old stock and usually one year old stock is shipped. The two year old amur honeysuckle also developed the blight later in the season. The one year old amur was not affected. Since this is a leaf blight and the shrubs are shipped in a dormant state, the stock will not carry the fungus on the leaves. Unless fungal spores are carried elsewhere on the plant or the vigor of the stock is reduced, this should not affect the stock to be shipped.

Cutting beds are established in the nursery to provide hybrid poplar cuttings. A few disease problems have developed since their establishment. The main two of these are Marssonina brunnea and Septoria musiva. M. brunnea is primarily a leaf disease but may have petiole and stem lesions associated. S. musiva causes a leaf spot but will also cause cankers which girdle and/or weaken the main stem and branches. Some clones are more resistant to these diseases than others. Clone 5271 (NE 19) was formerly thought to be resistant to S. musiva. It is now being discontinued at the state nursery as further research has shown it does not have as much resistance as previously thought.

There is a sizable Marssonina leafspot infection in the cutting nursery. This is causing some stem lesions and early leaf loss. However there is very little infection in the rooting beds. M. brunnea should not be a problem this year, but the disease can cause significant damage and should be carefully monitored.

Another concern in the nursery is the reservoir of pests provided in the windbreak trees. Pine needle scale has already been discussed. Another pest which is present in mature nursery trees is spider mites. The Austrian pine on the south edge of the nursery are heavily infected with Dothistroma needle blight. Diplodia shoot blight affected other mature pine this year. Phomopsis blight has been found in the cedar. The windbreak trees are necessary to protect the nursery beds, yet they can harbor pests. The best way to prevent serious problems from developing is to manage the location of beds to reduce risk of infection. The pests are

going to be present, but if managed and monitored, they can be kept under control.

Overall most of the nursery beds appear relatively healthy this year. So far there have not been any problems which will have a significant impact on next spring's shipping stock. If some of the problems present this year are found to be reoccurring and will also occur on outplanted stock, the supply of these species to the people of Iowa should be reevaluated.

CONCLUSIONS

Iowa timberlands are generally low quality hardwoods. Many areas in timber have been heavily grazed or still are. In most instances the forest has not been well managed. Pest problems are usually seen as insignificant beside the more serious management problems. Iowa timber owners are fortunate that more major pest problems do not occur in their stands. The poor condition of Iowa forests dictates that managers be more aware of forest pests. Two-lined chestnut borer and shoestring root rot (*Armillariella mellea*) are two potentially serious pest problems on stressed stands. Gypsy moth would add to stress on already troubled stands. Oak is a favored food of gypsy moth, so oak stands face a potential problem worse than oak wilt. It seems some hope still remains--green and white ash are less desirable to gypsy moth and produce a high value timber. But even ash it facing problems with ash decline.

The picture of Iowa forest lands is not all gloom and doom. A significant problem with pests does not exist at this time, but the potential is present. Wise forest management will be vital to improve the quality of Iowa's forests, which will in turn maintain their health.

Many of Iowa's conifer plantations and windbreaks are plagued by pest problems. This is not really surprising as the only conifers native to Iowa are white pine, red cedar, balsam fir, and Canadian yew. Most conifers planted here will undergo stress due to being planted out of their native environment. Managers can expect pest problems on conifers in Iowa, but these can be reduced by management procedures and silvicultural selection.

The aerial survey provided an inexpensive means of surveying Iowa timberlands. This is a good program and should be continued. The permanent pest plots add another dimension to the overall pest picture. There is good potential and room for improvement in both programs.

The summer internship is a valuable work experience. It provides a person to work full time on pest problems during the summer when the pests are active.

I would like to acknowledge the help of the following persons throughout the summer:

Roy Hatcher and all other Iowa Conservation Commission staff at the State Forest Nursery.

Each of the 12 District Foresters and the Area Foresters for the State Foresters and their field aides.

Dr. H.S. McNabb of Forest Pathology at Iowa State University.

Dr. Don Lewis of Entomology Extension.

Dr. Laura Sweets and Chris Luley of the Plant Disease Clinic.

Dr. Woody Hart of Forest Entomology.

and Dennis Haugen of Forest Entomology

ORNAMENTALS

Oak Leaf Deformation

A few reports from north central Iowa indicate a return of the oak leaf deformation condition seen a few times over the last several years. The deformation is distinctive; it is the cause that eludes us. The leaves appear to have been damaged by a leaf feeder such as cankerworms, but no insects are present. The leaf material from between the veins is missing. Usually there is a thin strip of foliage remaining along the major veins. The other distinctive feature is that the leaves appear to have been stretched. The combination of stretching and thin strips of foliage gives a strap-like appearance. Overall, the trees look thin or lacy.

At this point we do not know the cause of this deformation. No insects have been associated with the damage, and the symptoms do not fit any known plant diseases. Also, the symptoms are not consistent with herbicide injury. This condition has been reported throughout the midwest during the last few years, but no one seems to have an answer. There is speculation and theorizing that the deformation originates before leaf emergence. The factor receiving the most number of guesses is low temperature injury to buds.

It is obvious that insecticides and fungicides are not needed at this point in time. Convincing tree owners may take some persuasion but needless pesticide use must be avoided. -- D.R. Lewis and L. E. Sweets

Maple decline

During mid to late summer symptoms of decline became obvious on many hard maples, especially sugar maples. Evident symptoms include small leaf size, sparse canopies, yellowing of leaves, twig and branch dieback, premature fall coloration of leaves and premature leaf drop. Symptoms frequently begin in the upper crown of the tree and over several years may progress to include the entire tree. Occasionally entire trees are killed quite rapidly. In most cases of "maple decline" it is difficult to identify a single disease, insect or cultural factor which is the cause of the problem. Instead it is usually a combination or series of disease, insect, environmental or cultural conditions which result in maple decline. If symptoms of maple decline are identified early in the decline progression, it may be possible to save the tree by reducing or eliminating stress factors contributing to the decline and by proper pruning, watering and fertilizing of the tree. Unfortunately, much of the time maple decline is not noticed until it is to late to save the tree. In such cases proper watering, pruning and fertilizing may help prolong the life of the tree but it would be wise to consider planting replacement trees.

A number of disease, insect, environmental and cultural factors have been associated with maple decline. Some of the more commonly encountered of these factors are listed and described below. When diagnosing maple

decline it is important to consider site and environmental conditions as well as disease or insect problems which have occurred over the last few years.

FACTORS CONTRIBUTING TO MAPLE DECLINE

1. **Anthracnose, Phyllosticta leaf spot, tar spot and other fungal foliage diseases.** These diseases are favored by prolong periods of cool, wet weather in spring and early summer. A single season's infection is seldom damaging to a well established tree. However, defoliation year after year or heavy defoliation in addition to other stresses may contribute to maple decline.

2. **Scorch.** Scorch symptoms include browning around the margins of leaves and, if severe, of tissues between veins of leaves. Scorch develops when water is lost more rapidly from the leaves than it is replaced from the soil. This may result from low soil moisture, drying winds, soil compaction, or disease or injury to water-conducting tissues in branches, trunk or roots.

3. **Cankers.** A number of fungi can cause canker diseases (localized dead areas in bark of branches or the main trunk) of maples. Canker diseases are most common on previously weakened or stressed trees. Canker causing fungi usually enter by colonizing wounds in the bark. Once in the tree canker fungi parasitize the bark or phloem tissues disrupting water and nutrient movement in the tree and causing dieback of portions of the tree above the cankers. Management of canker diseases includes minimizing injuries to trees, maintaining good tree vigor and pruning out cankered branches.

4. **Collar Rot and Basal Canker Complex.** Research done at the University of Wisconsin indicates that deterioration of urban sugar maples often is associated with a decay of the trunk at or just below the soil line. Symptons occur at or below the soil line and include deep cracks in the bark, loose bark or bark which sounds "hollow" when tapped and which can be easily pulled off, obvious bark discoloration in patches or spots, and obvious discoloration of cambium and wood beneath loose bark. Collar rot and basal canker tend to develop on transplanted sugar maples so care should be taken when planting sugar maples. Plant trees at proper depth (avoid planting too deep), plant in proper size hole, distribute roots to diminish possiblity of girdling roots, mulch trees and wrap trunk to prevent sun scald injury.

5. **Lawn Mower Damage.** Bark tissues near the soil line may be bruised or wounded by lawn mowers, weed-eaters and other lawn equipment. If physical girdling from such mechanical injury does not kill tree directly, secondary pathogens may enter through these wounds and further weaken or kill the tree. Avoid wounding trees or mulch around trees to reduce likelihood of mower damage.

6. **Girdling Roots.** The term "girdling roots" refers to roots which wrap around or grow closely appressed to the main stem or large lateral roots eventually strangulating the main stem or lateral root. Girdling roots are more likely to occur if trees are planted too deep, if root systems are placed in a hole that is too small, if trees are twisted into the planting hole or if the tree is planted close to barriers which will restrict root growth and deflect roots back towards the main trunk. It may take many years for the girdling roots to reach sufficient size to restrict growth of the main stem or large laterals and for decline or dieback symptoms to develop in the crown of the affected tree. If diagnosed before serious damage has occurred, carefully cutting or removing the obstructing root may prevent decline due to girdling roots.

7. **Verticillium Wilt.** Verticillium wilt is a disease of the water-conducting tissues of trees. The fungus which causes the disease is parasitic on many plant species and can also live indefinitely in the soil. It enters susceptible plants through wounds, especially wounds on roots. Once in the tree the fungus moves up through the tree's water-conducting tissues. Symptoms of Verticillium wilt include sudden wilting of leaves on one or more twigs or branches, general yellowing of foliage, failure of buds to open in the spring, poor twig growth, dieback of twigs and branches through the tree, premature fall coloration and leaf drop, and green to greenish-brown discoloration of sapwood in branches showing advanced foliage wilt. If detected in time, pruning out diseased wood and proper watering and fertilizing may stimulate tree growth sufficiently for tree to recover from Verticillium wilt.

8. **Winter Injury.** Warm fall temperatures followed by a rapid drop in temperature, extremely low winter temperatures or fluctuating winter temperatures may result in injury or death of buds or water-conducting tissues in above ground parts of wood perennials. Plants damaged by winter injury may be slow to leaf out, may have buds which swell and start to open but then dry up and die or may have buds which open and few leaves begin to expand but then suddenly dry up and die. Portions of a tree weakened by winter injury may be colonized by secondary organisms, canker fungi, etc.

9. **Construction Damage.** Sugar, red and black maples are moderately sensitive to root damage during construction. When building, remodeling or working near maples care should be taken to avoid damage to roots, compaction of soil over the root system or change of grade around the tree.

10. **Salt Injury.** Red and sugar maples are very sensitive to salt such as deicing salts. Symptoms of salt injury include general yellowing and marginal scorch of leaves. Repeated exposures to salts may lead to death of twigs and decline of trees.

11. **Adverse Soil Moisture Conditions.** Extended periods of either unusually high or low soil moisture may injure root systems and stress trees. Trees weakened by drought or flooding are more prone to winter injury, cankers, secondary organisms, etc.

12. **Nutrient Deficiencies.** Red, sugar and silver maples on neutral or alkaline soils may show a yellowing of interveinal leaf tissues. Yellow foliage is more prone to attack by certain leaf spot fungi and to scorch.

"Insect, Weed and Plant Disease Newsletter" June 1, 1984 and July 20, 1984.

Aerial Survey Tentative & Actual
Schedule & Personnel

	Tentative	Actual	
July 30 -	Lv. Ames-8:30 a.m.	8:30 a.m.	Linda Haugen, Mike Brandrup
	Ar. Red Oak-9:15 a.m.	9:30 a.m.	pick-up Alan Pratt
	Lv. Red Oak-9:30 a.m.	9:40 a.m.	Fly to Monona County to start flight lines-Continue to Fremont County-estimated time 2 hrs.
	Ar. Red Oak-11:30 a.m.	12:25 p.m.	Leave Pratt
	Lv. Red Oak-11:45 a.m.	12:35 p.m.	
	Ar. Ames-12:30 p.m.	1:30 p.m.	
July 31	Lv. Ames-8:30 a.m.	8:20 a.m.	Linda Haugen
	Ar. Chariton-9:05 a.m.	9:05 a.m.	pick-up Duane Bedford and Randy Goerndt
	Lv. Chariton-9:20 a.m.	9:25 a.m. (11:00) a.m.	Fly Stephens State Forest-est. 1 hr.
	Ar. Keosauqua-10:30 a.m.	11:20 a.m.	Leave Bedford and Goerndt and pick-up Bruce Plum and Wayne Fuhlbrugge
	Lv. Keosauqua-10:45 a.m.	11:40 a.m.	Fly Shimek State Forest
	Ar. Keosauqua-11:45 a.m.	12:45 p.m.	Leave Plum and Fuhlbrugge and pick-up Goerndt and Bedford
	Lv. Keosauqua-12:00 p.m.	1:00 p.m.	
	Ar. Chariton-12:15 p.m.	1:45 p.m.	Leave Bedford and Goerndt and refuel and eat lunch
	Lv. Chariton-12:30 p.m.	2:40 p.m.	
	Ar. Ames-1:05 p.m.	3:20 p.m.	
August 1	Lv. Ames-8:30 a.m.	8:30 a.m.	Linda Haugen
	Ar. Prairie du Chien, WI 9:45 a.m.	9:40 a.m.	pick-up Jerry Kemperman and Jack McSweeney
	Lv. Prairie du Chien, WI 10:00 a.m.	10:00 a.m.	Fly Yellow River State Forest
	Ar. Prairie du Chien, WI 10:45 a.m.	10:50 a.m.	
	Lv. Prairie du Chien, WI 11:00 a.m.	11:10 a.m.	Leave Kemperman and McSweeney
	Ar. Ames-12:15 p.m.	12:40 p.m.	

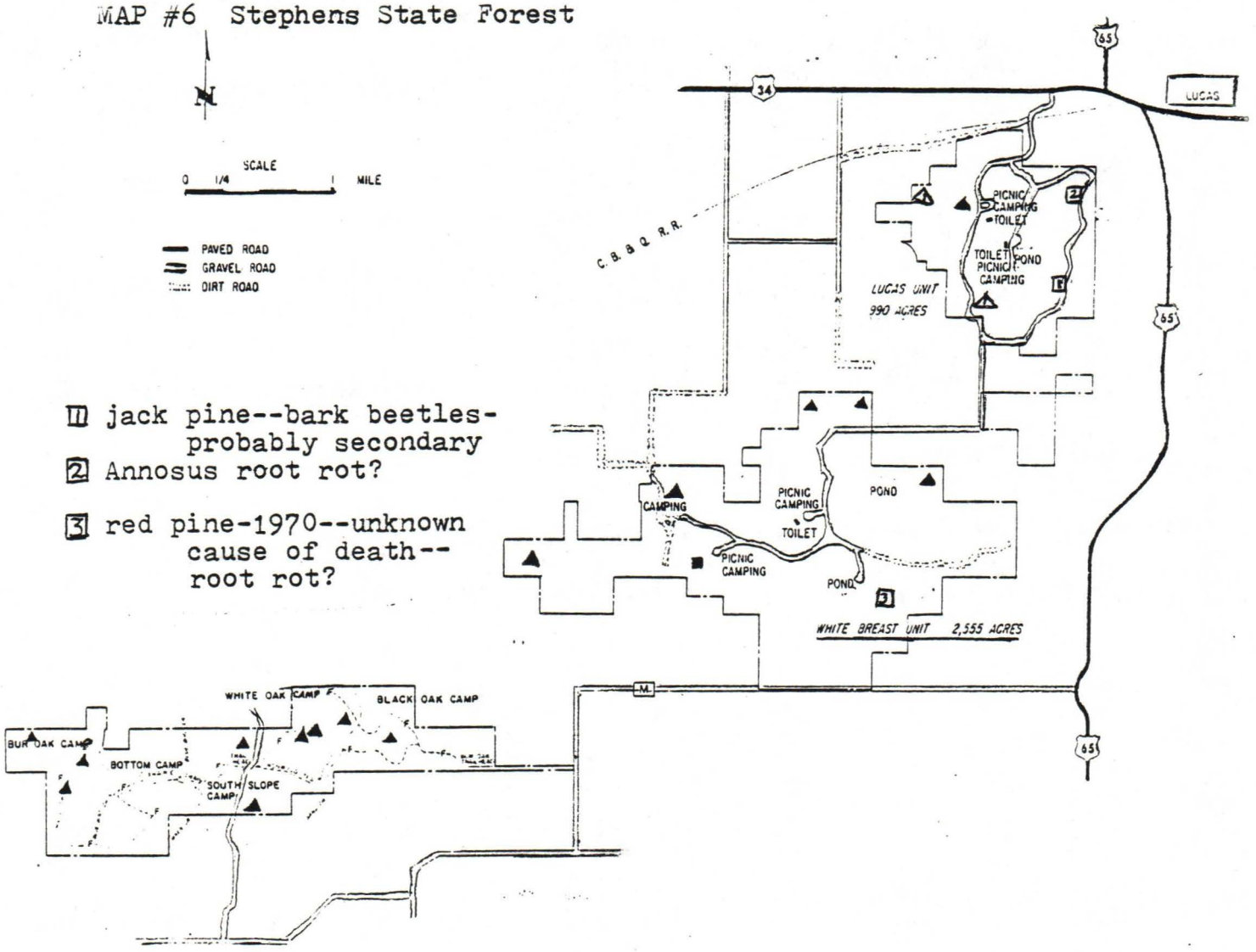
Roy Hatcher, State Protection Forester, was also involved in the survey.

AREAS FLOWN IN THE 1984 AERIAL SURVEY AND POINTS SKETCHMAPPED

Key for all maps:

- ▲ oak wilt or Dutch elm disease suspected from air
- ⚠ oak wilt verified on ground
- ⚠ Dutch elm disease verified on ground
- [X] pine problems--refer to number for explanation
- ■ pine problems--not verified
- ⊗ other--refer to number for explanation

MAP #6 Stephens State Forest

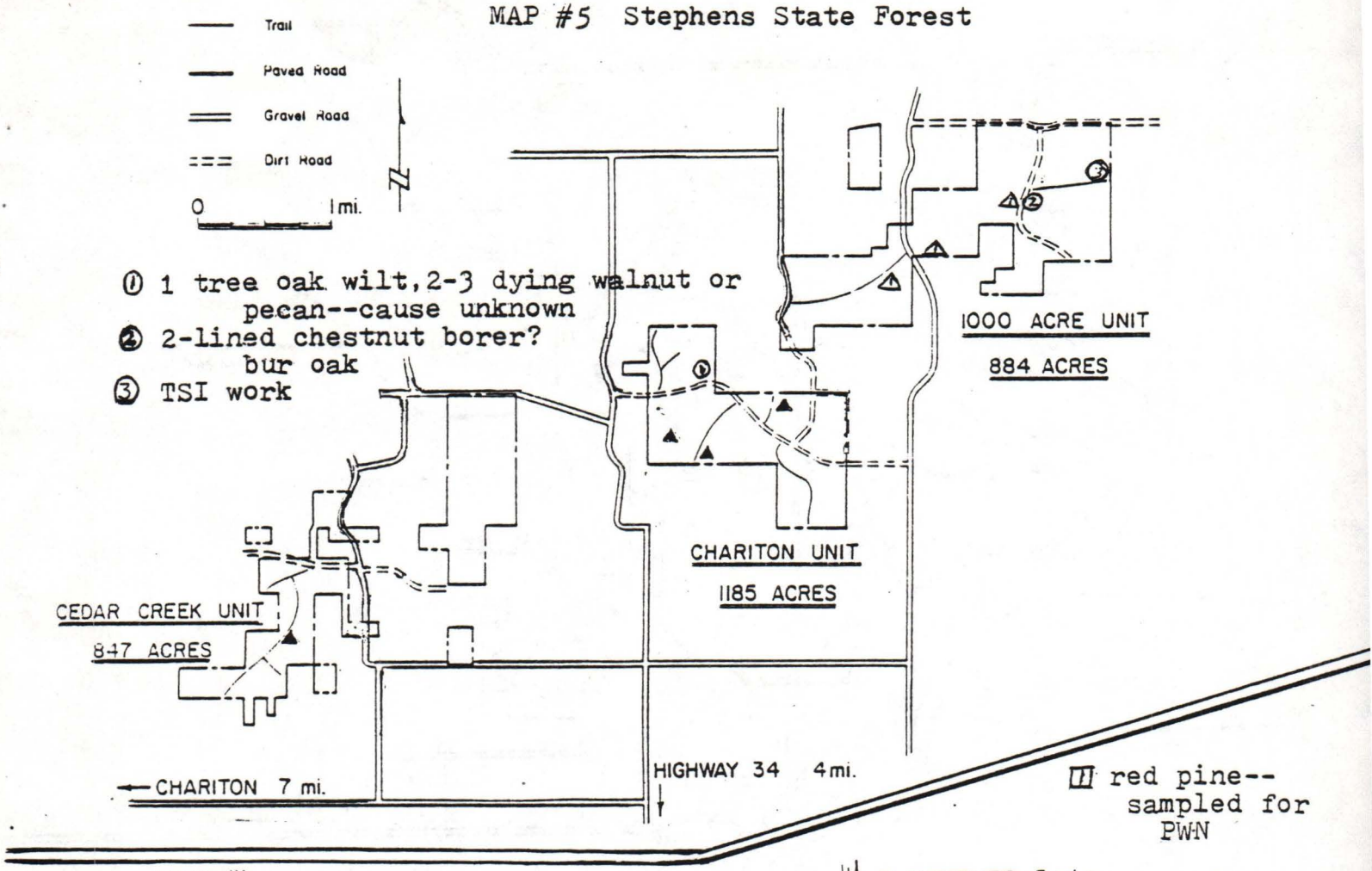


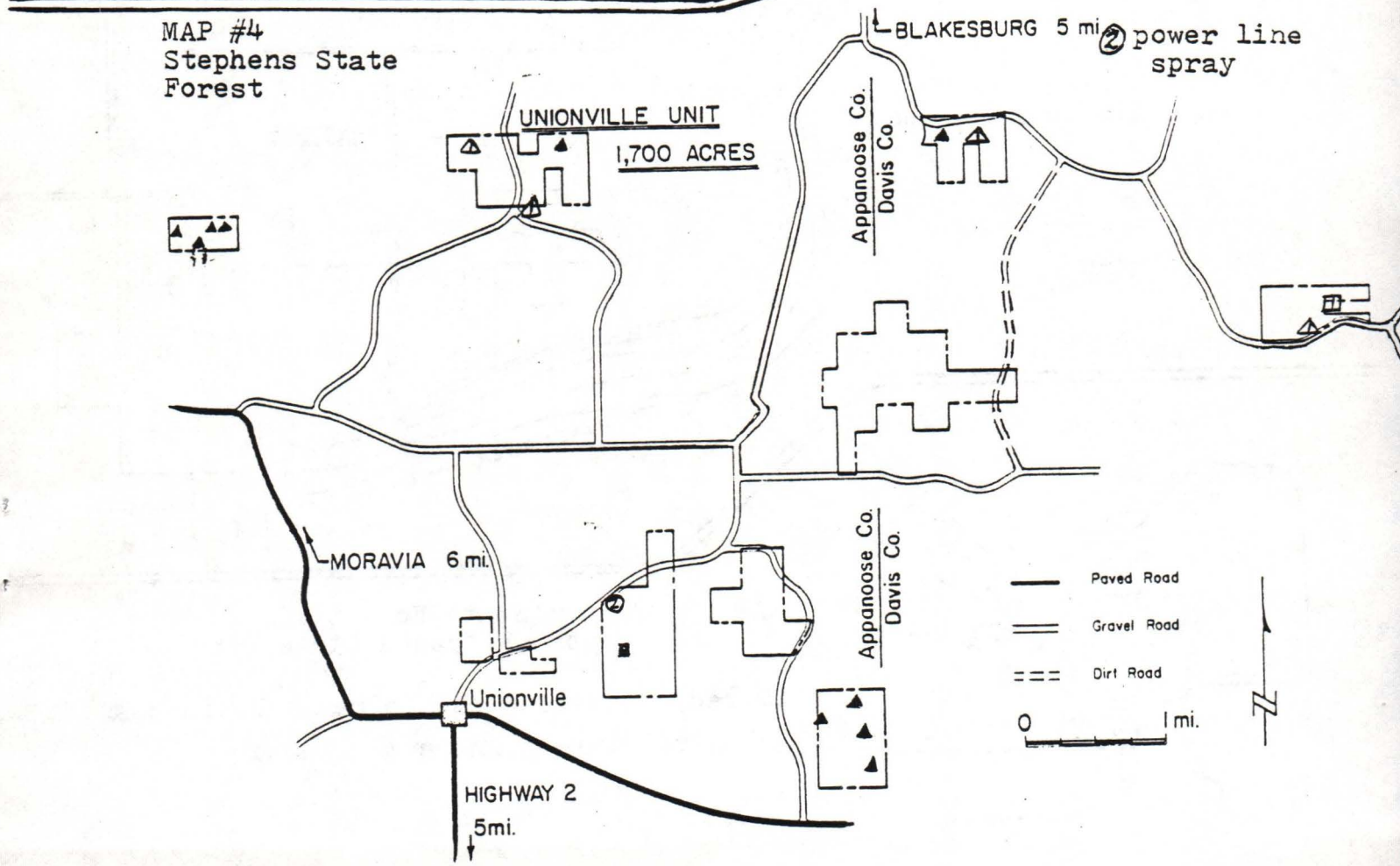
[1] jack pine--bark beetles-- probably secondary

[2] Annosus root rot?

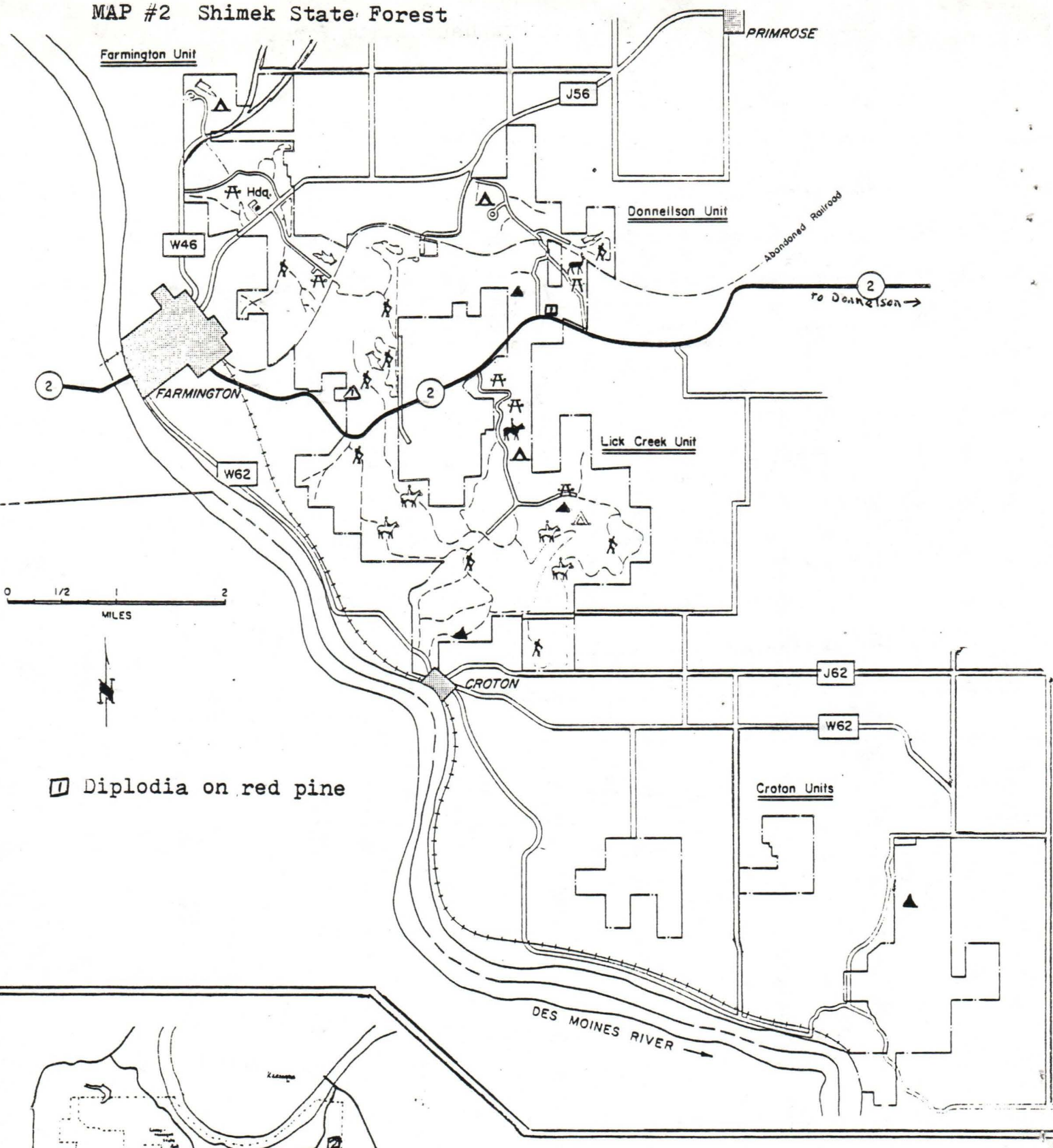
[3] red pine-1970--unknown cause of death-- root rot?

MAP #5 Stephens State Forest

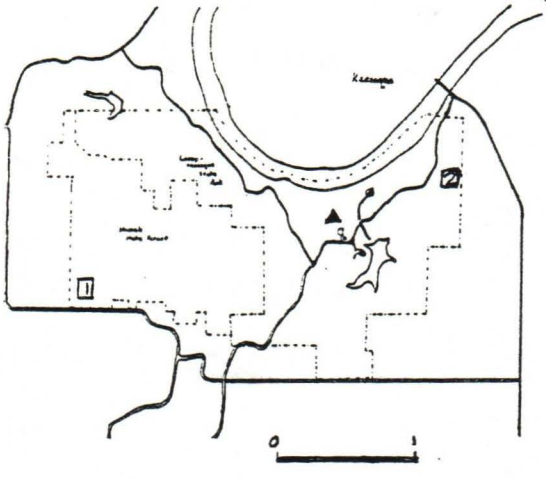




MAP #2 Shimek State Forest



[1] Diplodia on red pine

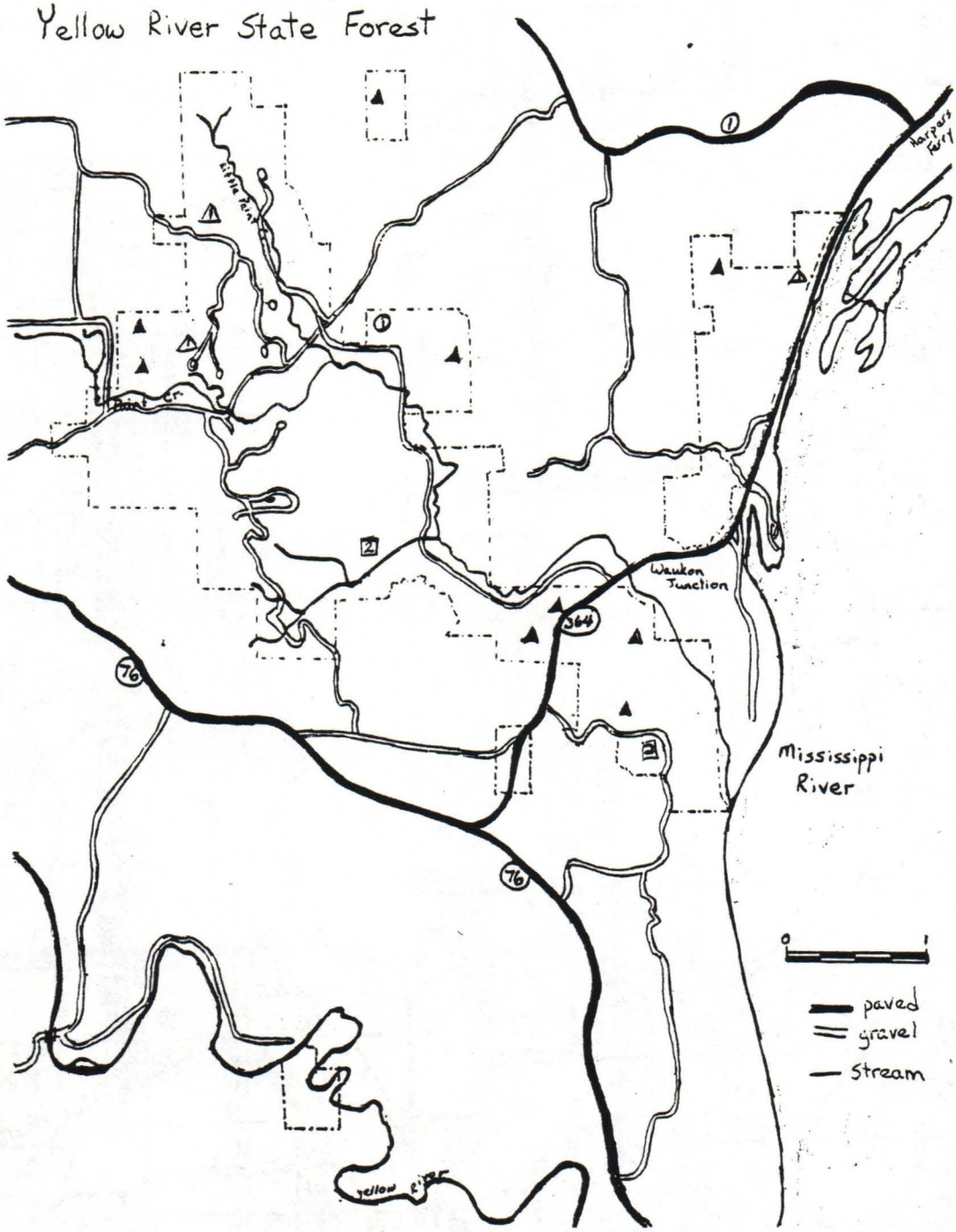


MAP #3 Shimek State Forest
Lacey-Keosaqua State Park

[1] red, Scotch, & jack pine-- PWN in past

[2] white pine--point not located

MAP #1

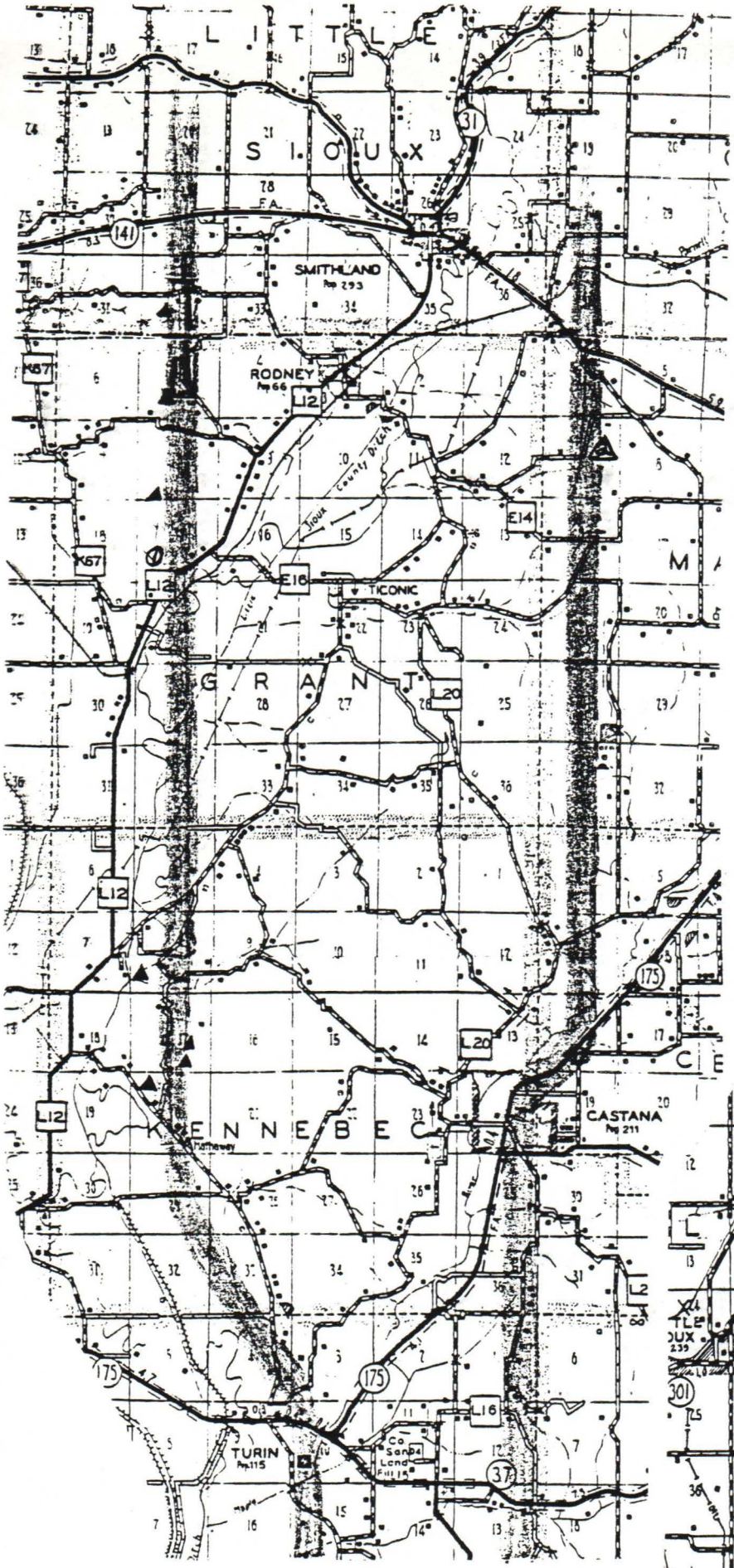


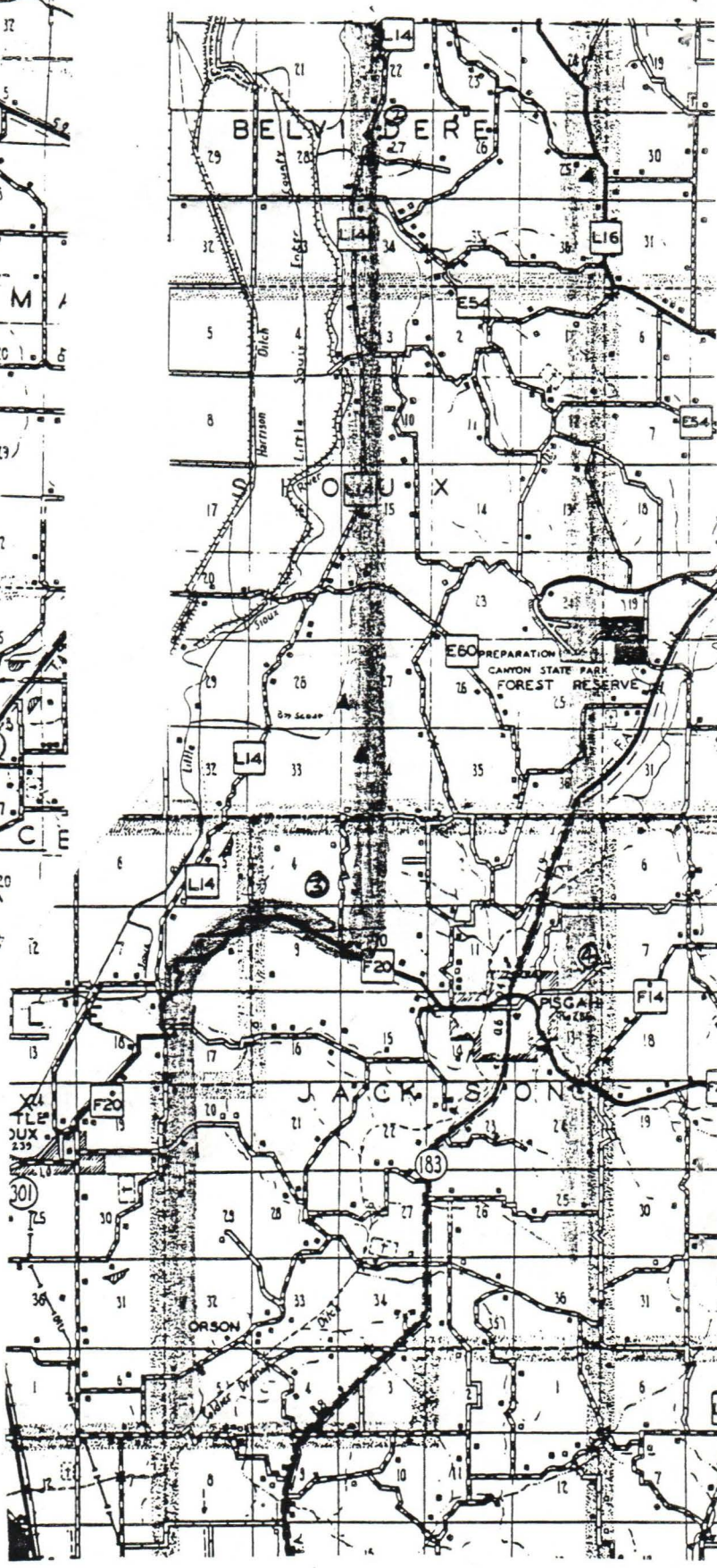
① chlorotic hardwoods--oaks

② white pine blister rust

MAP #7

Western Iowa





Continued in Next Column ↗

Western Iowa (continued)

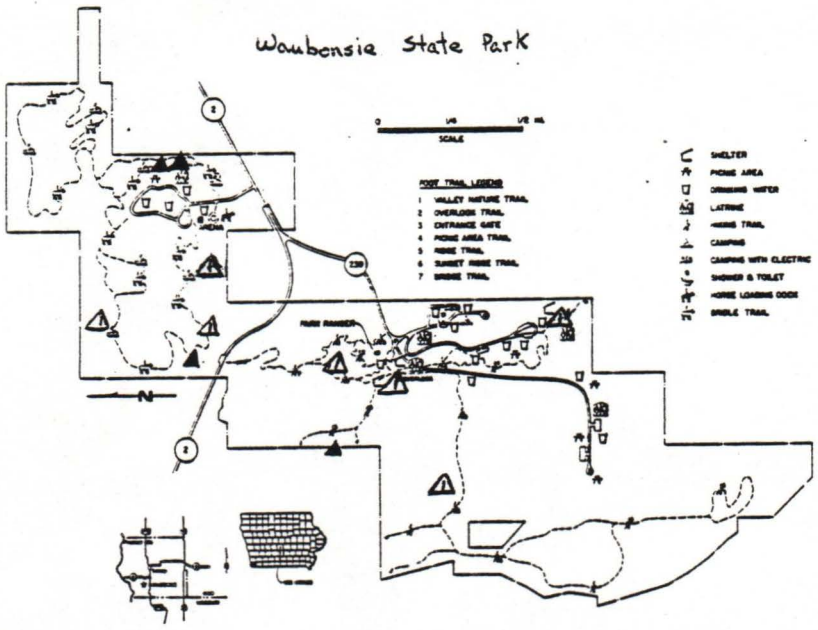
① hackberry lace bug

② dead cottonwood

③ cottonwood--Marssonina leafspot

④ oak wind damage or Dutch elm disease (point not located)

MAP #8 Waubonsie State Park



SUPPLEMENTAL REPORT ON FOREST PESTS

IN IOWA - 1984

PEST PLOTS

August observations on the permanent pest plots in the forest districts showed the following additional pest problems not found in June: Walnut caterpillars (light to heavy infestation); fall webworm (light to heavy infestation); and yellow-necked caterpillar (light to heavy infestation).

Many of the pests observed in June continued into the August observations with little or no intensity. Many minor problems were also observed.

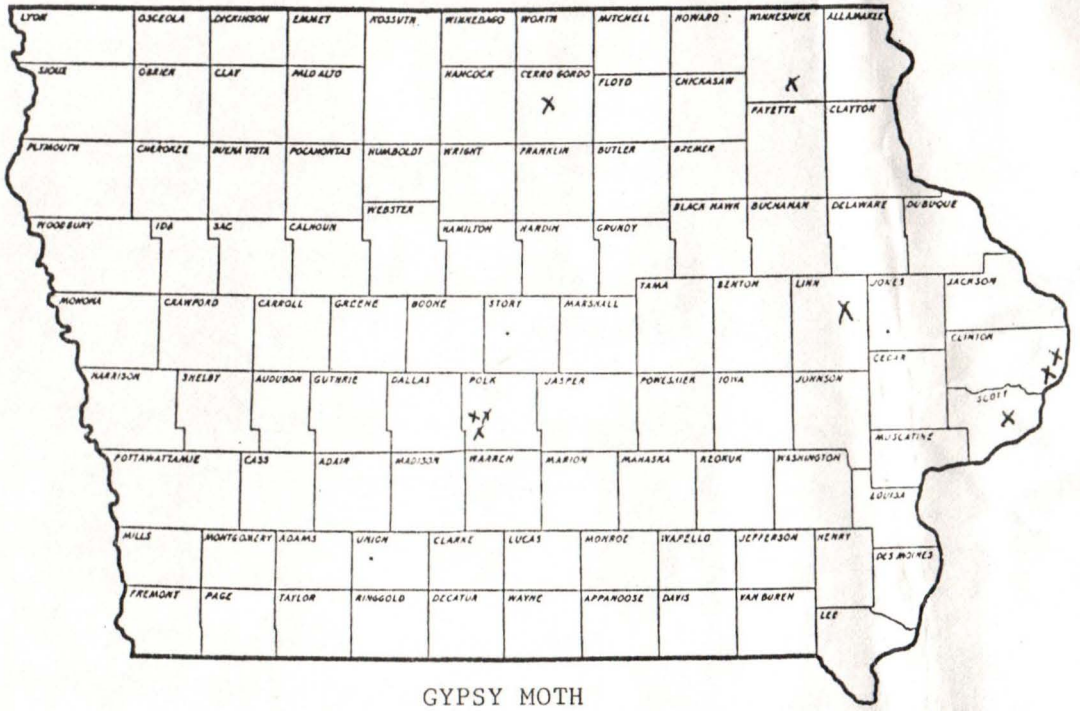
GYPSY MOTH

Three additional moths were found since the report was printed. Two were found in Clinton County in the cities of Clinton and Low Moor. These are new finds. A repeat find was found at a KOA campground in Scott County near Davenport off I-80.

SUMMARY

In general, the 1984 pest problems in Iowa were light in most instances. No real significant loss was observed statewide except for an increase in oak wilt activity.

IOWA



GYPSY MOTH

INSECT PEST SURVEY

1984

U. S. GOVERNMENT PRINTING OFFICE: 1932